



Clinical Health Care Indicators Monitoring as an Indicator of Health Services Quality and Safety

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ity of clinical health care, which represent a means of measurement, screening or warning. Monitoring Quality and Safety Indicators in Health Care Services is used as a guide to monitoring, evaluating and improving the quality of health care, and supporting services and organizational functions. In the field of health care, we measure the total treatment, outcome of the health-care process, patient satisfaction, unwanted events, quality of life, etc.

Abstract

Continuous progress in the nursing profession has a significant impact on the quality in the process of clinical care, which brings about new challenges and tasks for nurses to invest in new knowledge and skills. The healthcare process requires a systematic team approach in the design of evidence-based tasks, good clinical practice and clinical guidelines, documented standardized phenomena and evaluated measurements and tests. Measurement instruments and statistical tests of treatment effectiveness are used to assess the quality of health care provided. For a successful measurement and analysis of the quality of clinical care, it is necessary to have standardized healthcare documentation that allows treatment and outcomes monitoring. Qualitative and safety indicators are used to assess the qual-

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Introduction

The strategy „Health for All“, accepted by the member states of the WHO Regional Office for Europe, emphasizes the need to ensure the quality of the health-care service, by claiming that it can also be achieved through the identification of methods and procedures for systematic monitoring of the quality of health care provided to patients (1).

Quality improvement in most countries has a major role in reforming health systems and providing services. All countries face the challenges of ensuring access, fairness, security and patient participation, and developing skills-based technology, medical technology and evidence-based health care within the available resources (2,3).

Quality is an essential and necessary component of health care and the characteristic of every activity we carry out in health care and medicine. Quality health care is the right of every patient, that is, of both service users and the community (1). This becomes particularly important at the time of limited resources for health care and budget constraints. In the field of health care, quality is often intangible. Quality is best recognized in its absence. Many believe that it is enough to provide resources – namely, enough staff, equipment and money, and that quality will come by itself. This is mostly not happening. The American guru of quality Crosby (1979) has written a book *Quality is free* (he was actually saying that lack of quality costs) and in that book claims that monitoring the practice and reducing the losses can achieve significant savings that exceed the costs of introducing new procedures (2,4). The establishment of a quality and safety system of healthcare services is a duty of every health institution in the Federation of Bosnia and Herzegovina (FBiH), in accordance with the FBiH Law on Health Care (Official Gazette of the Federation BiH, No. 46/10) and the Law on the Quality Improvement System, Safety and Accreditation in Health Care (Official Gazette of the Federation BiH, No. 59/05 and 52/11) (5).

The introduction of a quality system in healthcare institutions has a number of benefits, of which we particularly emphasize: increasing reputation among customers, increasing patient satisfaction, transparency of the service process, reducing patient complaints, increasing patient accountability, trusting healthcare facili-

ties that operate in accordance with quality standards, improvement of management efficiency, easier inclusion of the newly employed, improvement of health planning and control, reduction of staff fluctuation, fair distribution of employee accountability, equalization of work processes in all parts of health care, reduction of unexpected situations, errors and health risks, better technical (outcome) and the functional (process) level of service (6).

The basic elements on which we determine the quality of medical services are indicators and standards (7,8).

The indicators are defined as measurable facts within the treatment process such as: mortality in a particular surgery, frequency of individual complications, frequency of unsatisfactory treatment results, patient satisfaction, hospital stay duration, or cost per day. Standards are the values with which we compare the indicators (9).

The quality of health services or health care is measured on the basis of standardized performance indicators, processes and outcomes. Indicators are measuring instruments for different comparisons (there are the biggest methodological obstacles): between departments, health institutions, regions, and countries. In a certain manner, indicators are a professional stimulus for better work. Today, clinical medicine can be compared to sports because sport is unimaginable without matches statistics, which is the future of clinical medicine/health care. (5,8,10).

In clinical practice, we follow and measure unfavorable events in the healthcare process through indicators. This implies monitoring of the healthcare plan, the occurrence of unwanted events in the healthcare process such as hospital infections, decubitus, patient falls, poor communication with staff and dissatisfaction with treatment.

Indicators for monitoring and measuring unwanted events in the clinical healthcare process are explicitly prescribed by Accreditation Standards for Hospitals. In order to carry out adequate measurements it is necessary to have adequate instruments that will meet the basic characteristics of indicators such as objectivity, validity and sensitivity (5,8).

In the process of establishing quality and safety of health services in clinical practice it is necessary to standardize the performance and processes, presented through quality documents (strategies, policies and procedures, forms, algorithms etc.) (10,11).

Standardization of clinical health services is carried out by health professionals based on good clinical practice, medicine and evidence-based health care, along with the adopted guidelines and protocols for health care (12).

Establishing the system of quality and security of health services in Clinical Center University of Sarajevo (CCUS)

The Clinical Center of University of Sarajevo (CCUS) has started setting up a quality system in accordance with Accreditation Standards for Hospitals (AKAZ, 2010), according to law and by-law in the field of health care. In accordance with this, in September 2012 the Organizational Unit for Quality and Safety of Health Services was established, which continuously monitors the implementation of standards and the fulfillment of criteria relating to the quality and safety of health services. There is an intensive work on creating documents on quality by competent health professionals (work teams), and they are adopted and applied as mandatory at the level of the whole institution.

Coordinators for Quality have been appointed within the Quality Assurance Process in each Organizational Unit/Clinic that, together with responsible persons (head and chief nurse), perform internal surveillance of healthcare improvements.

Supervision over the establishment of quality and safety of health services is carried out by the expert commission to improve the quality and safety of health services in the CCUS (13).

In the process of improving the quality and safety of health services, strategic documents have been established for risk management and treatment in case of unwanted events in the healthcare process (14).

All unwanted events/incidents are continuously reported on standardized forms, reconstruction and analysis of unwanted events are performed, and guidance is provided to improve the quality of the service and prevent further treatment risks.

The standardized healthcare documents that apply to CCUS are as follows: Nurses history of illness, Discharge paper of the nursing, Healthcare list, Healthcare list in intensive Care and therapy unit, Patient classification list, Decubitus report, Healthcare plan, Checklist for complications of health care, and numerous checklists. All Clinics are obliged to regularly report and analyze

unfavorable events, involve patients and their legal representatives throughout the process and find the most appropriate and best solution that will contribute to improving the quality of health care. Periodic statistical reports are submitted once a year to the Agency for Quality and Accreditation in Health Care of the Federation of Bosnia and Herzegovina for the purpose of strengthening self-centered culture, statistics, comparisons with other health institutions, etc. (5,14).

Goals

1. Determine the number of hospitalized patients on an annual basis, categorized by a high demand for progressive care;
2. Present the monitoring of the most common indicators of quality and safety in the healthcare process;
3. Determine the presence of unwanted events in the healthcare process at the annual level;
4. Present the establishment of a model of quality improvement and safety of health care and the impact on reducing unwanted complications in health care.

Methods

The research was conducted at the Clinical Center of the University of Sarajevo in the period from January 1st 2016 to December 31st 2018. The research is retrospective. For the research annual reports on quality and safety indicators for hospitals, monthly and periodic reports on internal surveillance in clinics, and reports of unwanted events in the healthcare process were used.

Results

Table 1. Overview of hospitalized patients in need of progressive health care

Year	Total number of admitted patients at the CCUS	No. of patients in need of progressive health care category 3 and 4	%
2016	49,639	4,941	10
2017	45,910	6,263	14
2018	47,391	7,325	15
Total	142,940	18,529	39

No significant difference between ratios of total number and number of patients in need over the observed time period ($p = 0.415$)

Table 2. Overview of categorized patients in need of progressive health care by Clinics

Year	OU/Clinic	Total hospitalized	Progressive health care category 3 and 4	%
2016	Clinic for heart and blood vessels diseases and rheumatism	3606	909	25
	Clinic for anesthesia and reanimation – Intensive care and therapy unit	699	699	100
	Clinic for gastroenterohepatology	1374	525	38
	Clinic for pulmonary diseases and tuberculosis	2738	485	18
	Clinic for cardiovascular surgery	1379	401	29
	Total	9796	3019	31
2017	Neurology clinic	2118	1300	61
	Clinic for heart and blood vessels diseases and rheumatism	2266	633	28
	Clinic for cardiovascular surgery	937	578	62
	Clinic for pulmonary diseases and tuberculosis	2900	512	18
	Clinic for anesthesia and reanimation – Intensive care and therapy unit	682	461	68
	Total	8903	3484	39
2018	Clinic for anesthesia and reanimation – Intensive care and therapy unit	651	651	100
	Clinic for heart and blood vessels diseases and rheumatism	3655	636	17
	Neurology clinic	2124	602	28
	Clinic for pulmonary diseases and tuberculosis	3520	463	13
	Clinic for cardiovascular surgery	1023	343	34
	Total	10973	2695	25

No significant difference between ratios of total number and number of patients in need over the observed time period ($p = 0.385$)

Table 3. Presence of hospital infections

Year	Total number of admitted patients at the CCUS	No. of reported clinical infections	%
2016	49639	602	0.77
2017	45910	380	1.31
2018	47391	556	1.17
Total	142940	1538	1,08

No significant difference between ratios of total number and number of patients with reported clinical infections over the observed time period ($p = 0.547$)

Table 4. Overview of reported decubitus in hospitalized patients

Year	Total number of admitted patients at the CCUS	No. of reported patients with decubitus	%
2016	49639	139	0.3
2017	45910	15	0.03
2018	47391	38	0.08
Total	142940	192	0,13

Significant difference between ratios of total number and number of patients reported with decubitus over the observed time period exists ($p < 0.001$). Less patients were reported in 2017 and 2018 in comparison to 2016.

Table 5. Patients with previous decubitus changes at home or other healthcare institutions

Decubital changes at home	2016	2017	2018
Number of patients with decubitus at home or other institution	136	5	30
Total number of hospitalized patients with decubitus	139	15	38
%	98%	87%	89%

No significant difference between ratios of total number and number of patients hospitalized with decubitus over the observed time period ($p = 0.247$)

Table 6. Patients who were admitted from nursing homes with decubitus changes from

Decubitus developed in a nursing home	2016	2017	2018
Number	3	8	4
Total number of hospitalized patients	139	15	38
%	2%	15%	11%

Significant difference between ratios of number of decubitus developed in a nursing home and number of patients hospitalized with decubitus over the observed time period exists ($p < 0.001$). Number of patients with decubitus developed in a nursing home has not decreased.

Table 7. Patients in which decubitus occurred at hospital

The decubitus occurred at hospital	2016	2017	2018
Number	3	2	4
Total number of patients with decubitus	139	15	38
%	2%	13%	11%

Significant difference between ratios of number of decubitus developed at hospital and number of patients hospitalized with decubitus over the observed time period exists ($p < 0.001$). Number of patients with decubitus occurred in hospital home has not decreased.

Table 8. Most frequent decubitus representation at clinics

Year	OU/Clinic	Total hospitalized	Reported decubitus	%
2016	Neurology clinic	2250	26	1.2
	Clinic for infectious diseases	1680	25	1.5
	Clinic for heart and blood vessels diseases and rheumatism	3606	21	0.6
	Clinic for anesthesia and reanimation	699	19	2.7
	Clinic for nuclear medicine and endocrinology	1100	15	1.4
	Total	9335	106	1.14
2017	Neurology clinic	2118	5	0.2
	Clinic for infectious diseases	761	3	0.4
	Clinic for abdominal surgery	1980	2	0.1
	Clinic for heart and blood vessels diseases and rheumatism	2266	2	0.09
	Hematology clinic	850	2	0.2
	Total	7975	14	0.18
2018	Neurology clinic	2124	11	0.5
	Clinic for heart and blood vessels diseases and rheumatism	3655	7	0.2
	Clinic for oncology	3533	5	0.1
	Clinic for infectious diseases	1343	3	0.2
	Hematology clinic	2481	2	0.1
	Total	13136	28	0,21

Significant difference between ratios of total number of patients and number of patients with reported decubitus over the observed time period exists ($p < 0.001$). Number of patients with reported decubitus decreased.

Table 9. Reported falls in patients in CCUS for the period 2016 – 2018

Year	Total number of admitted patients at the CCUS	Number of recorded falls of patients	%
2016	49639	38	0.07
2017	45910	28	0.06
2018	47391	19	0.04
Total	142940	85	0,06

No significant difference between ratios of total number and number of patients with recorded falls over the observed time period ($p = 0.177$)

Table 10. Recorded falls distribution by the clinics in CCUS for period 2016 – 2018

Year	OU/Clinic	Total hospitalized	Reported falls	%
2016	Clinic for skin and venous diseases	549	6	1.1
	Clinic for gastroenterohepatology	1404	5	0.4
	Clinic for pulmonary diseases and tuberculosis	2760	3	0.1
	Neurology clinic	2212	2	0.1
	Nephrology clinic	623	2	0.3
	Total	7548	18	0.24
2017	Nephrology clinic	737	4	0.5
	Clinic for orthopedics and traumatology	1740	4	0.2
	Clinic for oncology	1860	4	0.2
	Clinic for heart and blood vessels diseases and rheumatism	2266	3	0.1
	Hematology clinic	850	3	0.4
	Total	7453	18	0.24
2018	Nephrology clinic	737	4	0.5
	Clinic for eye diseases	1381	3	0.2
	Clinic for pulmonary diseases and tuberculosis	3520	2	0.06
	Clinic for nuclear medicine and endocrinology	627	2	0.3
	Clinic for oncology	3533	2	0.06
	Total	9798	13	0.13

No significant difference between ratios of total number and number of patients with recorded falls over the observed time period ($p = 0.137$)

Table 11. Patient's satisfaction in CCUS for the period 2016 – 2018

Year	Total number of admitted patients at the CCUS	Total surveyed patients	Percent of patient satisfaction	Decrease / Increase
2016	49639	4982	78.7%	
2017	45910	4673	81.2%	2.5%
2018	47391	5012	88.6%	7.4%
Total	142940	14667		

Discussion

Monitoring of quality and safety indicators in the healthcare process is mandatory for health institutions in order to measure and monitor: the quality of nursing work, the efficiency of overall hospital treatment, the incidence of complications in health care, the effects

of complications on the quality of life of patients, total cost of complications treatment during hospitalization, and comparison with other healthcare institutions.

The global goal of the World Health Organization is to ensure safe and quality patient care, or patient safety as an indicator of quality health care. Patient safety is the basis for quality health care. Research has shown that nurses just prevent the occurrence of a large number

of unwanted events and that they protect the patient from insecure practices. Each patient care procedure involves a certain degree of potential risk (15).

Many studies show the correlation between the characteristics of the nursing profession, particularly the level of nursing education and patient outcomes, such as unwanted events and mortality (16).

In our study we present the metrological indicators of the efficiency of the healthcare process in hospitalized patients. The results clearly show the increased number of patients admitted in the observed period, as well as a significant number of patients which are categorized with high grade for progressive health care.

Including the comorbidities and severity of clinical presentations of patients, it was expected that such patients develop some of the complications in the healthcare process.

The number of hospitalized patients requiring progressive health care increases year by year, and is especially dominated by the admission of elderly patients with significant presence of comorbidity and risk.

This number ranges from 10 to 14% of the total number of hospitalized patients. The most common are in the intensive care unit of the Clinic for anesthesia and reanimation with 100%, as all patients receive respiratory support. Significant percentages of patients requiring progressive health care were also recorded at the Clinic of cardiovascular surgery in 2017 – 578 (61%), Neurology clinic 1300 (61%), Clinic for pulmonary diseases and TBC – 512 (18%), Clinic for heart and blood vessels diseases and rheumatism – 633 (28%). By monitoring the quality and safety of health service indicators in 2016 and 2018, it was noted that this figure is approximate to the observed period in 2017, and that these are the clinics where there is a general need for categorization of patients with a high score of 3 and 4.

When observing the indicators on presence of hospital infections in hospitalized patients, it can be seen that there is a significant decrease from 2016-2018. The regularity of reporting in CCUS is 90%. The highest presence of isolates was, as expected, in the Intensive care unit and the Clinic for anesthesia and reanimation, where in 2016 *Acinetobacter Baumannii* significantly dominated. By introducing standardized quality documents, guidelines and algorithms for prevention of hospital infections, this number decreased in 2017 by 60%, which is a special indicator of quality of health services. Guidelines have been introduced based on scien-

tific evidence and good medical practice at the hospital. Performing oral cavity hygiene at least 2 times a day, placing the patient in the semi-sitting position, a regular daily bathing with iodine brush for surgical washing of the hands (10% iodine solution), control of clinical nutrition, yielded a good result. Comparing the annual rate of hospital infections with the results of other hospitals in the region and Europe, it is noticed that there is low prevalence, without epidemiological significance.

However, continuous monitoring of the occurrence of hospital infections, compliance with adopted protocols and procedures contributes to reducing the risk of hospital infections.

One of the special risks in the hospital is a fall of patients. In 2016, 38 injuries were recorded in patients who did not result in a permanent patient disability. By analyzing the incidents, there was a risk of falls in the hospital and more active steps were taken to prevent them. Working groups in cooperation with the Quality and Safety Department of Health Services have created standardized quality documents for assessing the risk of falling, improving the ambience in patient rooms and enhancing surveillance. Thus in 2017 the number of falls was reduced by 10, and in 2018 the total number of falls was 19.

Analyzing the reported falls, it was noted that they were the result of lower mobility patients, due to poor judgment by the patient himself/herself, after getting out of bed, going to the toilet, etc.

There are about 35 million elderly people in the United States according to the data estimate, of which 10 million had a fall. In 2000, 1.8 million hospital admissions were reported due to the fall, of which 340,000 with a hip fracture. The cost of treatment was 16.4 billion US dollars (17).

In a study of 17,440 patients from 42 intensive care units (Shortell et al., 1994), the availability of technologies in intensive care units was significantly associated with a low risk of developing adverse events for patients (18).

In a study conducted in 2013, twenty falls have been reported in the hematology department. The most common causes of the fall were general weakness, dizziness, vertigo, anemia, impaired mobility, febrility, patient's uncritical assessment, confusion, changes in the environment, patient lack of cooperation. At eighteen drops (90%) there were more than three risk factors for the fall (19).

Chronic wounds are a growing socioeconomic problem in developed countries and occur in 1-2% of the population. It is estimated that this number will increase due to population aging. According to World Health Organi-

zation data, population growth by 30% and life expectancy up to 85 years should be expected in 2020 (20).

In the observed period from 2016 to 2018 the number of reported decubitus cases in patients hospitalized at the hospital is not worrisome, considering the low rate of patients with confirmed decubital change and 0.3% in 2016, with a significant decline trend in 2017 and 2018 ranging from 0.03 to 0.08%. Since there has been a significant number of patients admitted with a progressive health care requirement and an insufficient number of executives are present in the healthcare process, the number of registered decubitus cases developed in the hospital is minor, namely 3 in 2016, 2 in 2017, and 4 in 2018. A significant number of decubital changes in patients who are hospitalized from home care or the home for the elderly are generally noted. The decubitus is most often represented in the Neurology clinic, the Clinic for heart and blood vessels disease and rheumatism, the Clinic for anesthesia and reanimation – Intensive care and therapy unit. In 2016 an increased number of decubitus was recorded at the Clinic for infectious diseases, out of a total of 1680 patients received in 25 (1,5%) patients. The reason for this is increased inflow of older patients with severe forms of flu from their home or other institutions.

In the General Hospital in Dubrovnik in the period from January 1st 2014 until December 31st 2015 of the 88 patients treated with chronic wound there were 27 (31%) women and 61 (69%) males (21).

The study on decubitus as an indicator of the quality of health care was carried out at the Clinical Hospital Center „Sveti Duh“ Zagreb in the intensive care unit of the Neurology clinic, during the period from January 1st 2012 until December 31st 2015. The study included 102 patients.

In the observed period, it was concluded that in 2012 were the most frequently received patients with stage II decubitus who came from other departments or institutions. In 2014 a V stage of decubitus was recorded in one patient. In 2015 there was an increase in patients who came from their home with a developed stage II decubitus. In 2012, 13 decubitus cases occurring in the department were associated with the severity of the clinical image and the presence of comorbidities. In 2015, excellent results were recorded versus 2014 where success was achieved in decubitus treatment by introducing preventive measures (22).

Considering the satisfaction indicators of health services at the hospital, it was observed that in the observed period the satisfaction of patients was greater than 70%. The increase in satisfaction is present in 2018, with 88.6% of the total of 5012 respondents.

An examination of the satisfaction of the patients with the quality of the provided health services was carried out in the General Hospital of Zadar, during July and August 2015. The survey included a sample of 100 respondents, hospitalized at the Department of surgery and internal medicine. Patients express the highest degree of satisfaction with the nursing and nursing engagement so that for both aspects of satisfaction the average rating of hospitalized patients' satisfaction is above 4.3 of the possible maximum score of 5 (23).

Conclusion

1. The safety of patients in the hospital should be in the first place, and the nurses who spend most time with the patients are expected to provide conditions for safe accommodation in the hospital, conditions for a safe and quality service in the healthcare process and the application of standardized procedures based on scientific evidence and evidence from practice.
2. Reporting, analyzing and reconstruction of unwanted events in the healthcare process is mandatory in all healthcare institutions, with the aim of improving the quality and safety of the healthcare process.
3. Continuous reporting on quality indicators in the healthcare process contributes to strengthening organizational culture, risk and unwanted events prevention, and the planning of staff and equipment essential to the quality of the healthcare process.
4. Quality and safety indicators of the healthcare process should be used for internal and external evaluation, comparison of team efficiencies, comparison with other teams in other healthcare institutions, and health marketing.
5. The results of the quality healthcare indicator monitoring should be used by healthcare financiers and health ministries in order to motivate healthcare institutions and individuals for quality performance.
6. Nurses should be supported by healthcare institutions for continuous professional development, encouraging the specialization of work tasks in health care, thus increasing competence, accountability and independence in work, thus recognition and validation within the healthcare system.

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MONITORING INDIKATORA KLINIČKE ZDRAVSTVENE NJEGE KAO POKAZATELJ KVALITETE I SIGURNOSTI ZDRAVSTVENIH USLUGA

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Kontinuirani napredak u sestrinskoj profesiji ima značajan utjecaj na kvalitetu u procesu kliničke njege, što sa sobom donosi nove zadatke i izazove za medicinske sestre da ulažu u nova znanja i vještine. Proces zdravstvene skrbi zahtijeva sustavni timski pristup u osmišljavanju zadataka utemeljenih na dokazima, dobru kliničku praksu i kliničke smjernice, dokumentirane standardizirane pojave i vrednovanje mjerenja i ispitivanja. Instrumenti za mjerenje i statistički testovi učinkovitosti liječenja koriste se za procjenu kvalitete pružene zdravstvene skrbi. Za uspješno mjerenje i analizu kvalitete kliničke njege potrebno je imati standardiziranu zdravstvenu dokumentaciju koja omogućuje praćenje liječenja i ishoda. Kvalitativni i sigurnosni indikatori koriste se za procjenu kvalitete kliničke zdravstvene njege, i oni predstavljaju sredstvo mjerenja, screeninga ili upozorenja. Praćenje pokazatelja kvalitete i sigurnosti u zdravstvenim službama koristi se kao vodič za praćenje, ocjenjivanje i poboljšanje kvalitete zdravstvene skrbi te pratećih usluga i organizacijskih funkcija. U području zdravstvene skrbi mjeri se ukupno liječenje, ishod procesa zdravstvene skrbi, zadovoljstvo pacijentata, neželjeni događaji, kvaliteta života itd.

Ključne riječi: indikatori, klinička zdravstvena njega, monitoring, kvaliteta, sigurnost, sestrinska praksa
